Pre Calculus **Name:**
3.3C Classwork **Date:**

Use the definition of the logarithmic function to find x.

1. (a) $\log_5 x = 4$ (b) $\log_{10} 0.1 = x$

2. (a) $\log_4 2 = x$ (b) $\log_4 x = 2$

3. (a) $\log_x 1000$ (b) $\log_x 25 = 2$

Evaluate the expression.

4. $\log_3 \sqrt{27}$

5. $\log_2 160 - \log_2 5$

6. $\log 4 + \log 25$

7. $\ln(\ln e^{e^{200}})$

8. $\ln \sqrt{z}$

Expand the logarithm using the three "Laws" of logarithms

9. $\log_2 (AB^2)$

10. $\log_a (x^2/yz^3)$

11. $\ln \sqrt{(3r^2s)}$

12. $\log_2(x(x^2+1)/\sqrt{x^2-1})$

Use the Laws of Logarithms to combine the expression as a single logarithm

13. $\log 12 + \frac{1}{2} \log 7 - \log 2$

14. $\log_5(x^2-1) - \log_5(x-1)$

Use the Change of Base Formula and a calculator to evaluate the logarithm, correct to six decimal places. Use either natural or common logarithms.

15. $\log_2 5$

16. $\log_5 2$

17. $\log_7 68$

18. $\log_2(34)$

19. $\log 56$

20. $\log_3(18)$